

Respiratory Carousel Lab

Station 1: Spirometer Activity

LUNG VOLUME (ml)			
	Vital Capacity	Expiratory Reserve	Tidal Volume
TRIAL 1			
TRIAL 2			
TRIAL 3			
Total			
Average			

Station 2: Estimated Vital Capacity

Estimated Vital Capacity

Research has shown that the capacity of a person's lungs is proportional to the surface area of his or her body. To find the surface area, you will need to know your height and weight. There are a couple of different ways to calculate your body surface area mathematically. Either use the equation below or go to a website that has an automatic calculator. (A google search on "body surface area calculator" will yield many pages that have these calculators)

$$BSA (m^2) = ([Height(cm) \times Weight(kg)] / 3600)^{1/2}$$

$$BSA = \text{SQRT} (cm \cdot kg / 3600)$$

Once you have calculated your surface area,
a second equation will calculate your estimated vital capacity.

Males: $BSA \times 2500$

Females: $BSA \times 2000$

Estimated Vital Capacity	
Height (cm)	
Mass (kg)	
Surface Area	
Vital Capacity	

Station 3: Breathing Rate and Oxygen Demand Activity

	Resting	Moderate Activity	Greater Activity
Heart Rate			
Breathing Rate			

Station 4: Factors Affecting Lung Capacity

Hypothesis: Predict which factors found in the chart will influence vital lung capacity the most and give a justification. Make sure to write down your prediction before class data is compiled and analysed.

Gender (M/F)	Height (cm)	Smoking (hrs./month)	Exercise (hrs./month)	Asthma (Y/N)	Vital Lung Capacity (ml)

****Please enter this data in to the Google Docs Chart on the laptop at the station**

Station 5: Carbon Dioxide in Inhaled and Exhaled Air **** **PERFORMED BY TEACHER**

- In this flask you will find Limewater $\text{Ca}(\text{OH})_2$, a base, and Phenolphthalein and indicator that is Pink when basic.
- Observe what happens to the liquid in the flask when air is **EXHALED** through a straw onto the liquid
- Explain what you can infer about the gas content of exhaled air vs. surrounding air using your observations and the chemical information below

$\text{Ca}(\text{OH})_2$ =limewater = calcium hydroxide = base = pink color in phenolphthalein

$\text{CO}_2 + \text{H}_2\text{O} \rightarrow \text{H}_2\text{CO}_3$ = carbonic acid

$\text{H}_2\text{CO}_3 + \text{Ca}(\text{OH})_2 \rightarrow \text{CaCO}_3 + \text{H}_2\text{O}$